CLAIMS

1. (Currently amended) A continuous process of making polytrimethylene ether glycol comprising:

(a) continuously providing 1,3-propanediol reactant and polycondensation catalyst; and

(b) continuously polycondensing the 1,3-propanediol reactant to polytrimethylene ether glycol in a column reactor having two or more reaction stages using the polycondensation catalyst.

Claims 2-19 (Canceled)

20. (original) The process of claim 1 wherein the catalyst is homogeneous.

21. (original) The process of claim 20 wherein the catalyst is selected from the group consisting of a Lewis Acid, a Bronsted Acid, a super acid, and mixtures thereof.

22. (original) The process of claim 21 wherein the catalyst is selected from the group consisting of inorganic acids, organic sulfonic acids, heteropolyacids, and metal salts thereof.

23. (original) The process of claim 1 wherein the catalyst is selected from the group consisting of sulfuric acid, fluorosulfonic acid, phosphorus acid, p-toluenesulfonic acid, benzenesulfonic acid, phosphotungstic acid, phosphomolybdic acid, trifluoromethanesulfonic acid, 1,1,2,2-tetrafluoro-ethanesulfonic acid, 1,1,1,2,3,3-hexafluoropropanesulfonic acid, bismuth triflate, yttrium triflate, ytterbium triflate, neodymium triflate, lanthanum triflate, scandium triflate and zirconium triflate.

24. (original) The process of claim 1 wherein the catalyst is sulfuric acid.

Claims 25-45 (canceled)

46. (Previously presented) A continuous multi-stage process comprising reacting at least one reactant in a liquid phase in an up-flow column reactor having two or more stages, and forming a gas or vapor phase by-product wherein the gas or vapor phase by-product is continuously removed at the top and at least one intermediate stage.

47. (Previously presented) The process of claim 1 wherein the polycondensing is carried out at a temperature greater than 150°C.

48. (Previously presented) The process of claim 47 wherein the temperature is greater than 160°C.

49. (Previously presented) The process of claim 47 wherein the temperature is greater than 180°C.

50. (Previously presented) The process of claim 1 wherein the polycondensing is carried out at a temperature less than 250°C.

51. (Previously presented) The process of claim 50 wherein the temperature is less than 220°C.

52. (Previously presented) The process of claim 50 wherein the temperature is less than 210°C.

53. (Previously presented) The process of claim 47 wherein the temperature is less than 210°C.

54. (Previously presented) The process of claim 1 wherein the polycondensation is carried out at a pressure of less than one atmosphere.

55. (Previously presented) The process of claim 54 wherein the pressure is less than 500 mm Hg.

56. (Previously presented) The process of claim 54 wherein the pressure is less than 250 mm Hg.

57. (Previously presented) The process of claim 54 wherein the pressure is greater than 1 mm Hg.

58. (Previously presented) The process of claim 57 wherein the pressure is greater than 20 mm Hg.

59. (Previously presented) The process of claim 57 wherein the pressure is greater than 50 mm Hg.

60. (Previously presented) The process of claim 1 wherein the 1,3-propanediol reactant is selected from: 1,3-propanediol, dimers of 1,3-propanediol, trimers of 1,3-propanediol, and mixtures thereof.

61. (Previously presented) The process of claim 60 wherein the 1,3-propanediol reactant is selected from: 1,3-propanediol, and a mixture containing at least 90 weight % of 1,3-propanediol.

62. (Previously presented) The process of claim 60 wherein the 1,3-propanediol reactant is 1,3-propanediol.

63. (Previously presented) The process of claim 62 wherein the polycondensation pressure is between 50 and 250 mm Hg.

64. (canceled)

65. (Currently amended) The process of claim 1 wherein the ~~polycondensation is carried out in a~~ column reactor is equipped with a heat source located within the reaction medium.

66. (Currently amended) The process of claim 1, wherein the column reactor has 3-30 stages.

67. (Currently amended) The process of claim 1 wherein the column reactor ~~has~~ is a vertical column reactor and 4-20 stages.

68. (Currently amended) The process of claim 1 wherein the column reactor has 8-15 stages.

69. (Previously presented) The process of claim 1 wherein the 1,3-propanediol reactant is fed at multiple locations to the reactor.

70. (Previously presented) The process 1 wherein an inert gas is added to the reactor at one or more stages.

71. (Previously presented) The process of claim 1 wherein water vapor is generated as a by-product of the reaction and is removed from the reactor in at least one intermediate stage.

72. (Currently amended) ~~The~~ A continuous process of ~~claim 1~~ making polytrimethylene ether glycol comprising:

(a) providing 1,3-propanediol reactant,

(b) providing polycondensation catalyst; and

(b) polycondensing the 1,3-propanediol reactant to polytrimethylene ether glycol;

wherein the polycondensation is first carried out in at least one prepolymerizer reactor and then polycondensation continued continuously in a column reactor having two or more reaction stages using the polycondensation catalyst, the 1,3-

propanediol reactant comprises 90 weight % or more 1,3-propenediol, and in the prepolymerizer reactor the 1,3-propanediol is polymerized with the polycondensation catalyst to a degree of polymerization of at least 5.

73. (Cancelled)

74. (Currently amended) The process of claim 72 wherein the 1,3-propanediol reactant is 1,3-propanediol and in the at least one prepolymerizer reactor the 1,3-propanediol is polymerized with the catalyst to a degree of polymerization of at least 20.

75. (Currently amended) The process of claim ~~72~~ 74 wherein the at least one prepolymerizer reactor is a well-mixed tank reactor.

76. (Currently amended) The process of claim ~~72~~ 74 wherein steam generated in the at least one prepolymerizer reactor is removed and the product of the at least one prepolymerizer is fed to the column reactor.

77. (Currently amended) The process of claim ~~72~~ 74 wherein an inert gas is fed to the column reactor

78. (Previously presented) The process of claim 1 wherein the polytrimethylene ether glycol has a number average molecular weight of at least 1,000.

79. (Previously presented) The process of claim 1 wherein the 1,3-propanediol reactant comprises 20 weight percent or less of one or more comonomer diols.

80. (Previously presented) The process of claim 79 wherein said comonomer diols are selected from: 1,6-hexanediol, 1,7-heptanediol, 1,8-octanediol, 1,9-nonanediol, 1,10-decandiol, 1,12-dodecanediol, 3,3,4,4,5,5-hexafluoro-1,5-

pentanediol, 2,2,3,3,4,4,5,5-octafluoro-1,6-hexanediol, and 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10-hexadecafluoro-1,12-dodecanediol.

81. (Previously presented) The process of claim 79 wherein said comonomer diols are selected from cycloaliphatic diols and polyhydroxy compounds.

82. (Previously presented) The process of claim 81 wherein said comonomer diols are selected from 1,4-cyclohexanediol, 1,4-cyclohexanedimethanol, isosorbide, glycerol, trimethylolpropane, and pentaerythritol.

83. (Currently amended) A continuous process of making polytrimethylene ether glycol comprising: (a) continuously providing 1,3-propanediol reactant and polycondensation catalyst; and (b) continuously polycondensing a ~~1,3 propanediol~~ 1,3-propanediol reactant to polytrimethylene ether glycol in a reactor at a pressure of less than one atmosphere using the polycondensation catalyst.

84. (Previously presented) The process of claim 83 wherein the pressure is less than 500 mm Hg.

85. (Previously presented) The process of claim 83 wherein the pressure is less than 250 mm Hg.

86. (Previously presented) The process of claim 83 wherein the pressure is greater than 1 mm Hg.

87. (Previously presented) The process of claim 86 wherein the pressure is greater than 20 mm Hg.

88. (Previously presented) The process of claim 86 wherein the pressure is greater than 50 mm Hg.

89. (Previously presented) The process of claim 83 wherein the 1,3-propanediol reactant comprises 20 weight percent or less of one or more comonomer diols.

90. (Previously presented) The process of claim 89 wherein said comonomer diols are selected from: 1,6-hexanediol, 1,7-heptanediol, 1,8-octanediol, 1,9-nonanediol, 1,10-decandiol, 1,12-dodecanediol, 3,3,4,4,5,5-hexafluoro-1,5-pentanediol, 2,2,3,3,4,4,5,5-octafluoro-1,6-hexanediol, and 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10-hexadecafluoro-1,12-dodecanediol.

91. (Previously presented) The process of claim 89 wherein said comonomer diols are selected from cycloaliphatic diols and polyhydroxy compounds.

92. (Previously presented) The process of claim 91 wherein said comonomer diols are selected from 1,4-cyclohexanediol, 1,4-cyclohexanedimethanol, isosorbide, glycerol, trimethylolpropane, and pentaerythritol.

93. (Previously presented) The process of claim 83 wherein the 1,3-propanediol reactant is selected from: 1,3-propanediol, dimers of 1,3-propanediol, trimers of 1,3-propanediol, and mixtures thereof.

94. (Previously presented) The process of claim 83 wherein the 1,3-propanediol reactant is selected from: 1,3-propanediol, and a mixture containing at least 90 weight % of 1,3-propanediol.

95. (Previously presented) The process of claim 83 wherein the 1,3-propanediol reactant is 1,3-propanediol.

96. (New) A continuous process of making polytrimethylene ether glycol comprising: continuously providing (1) 1,3-propanediol reactant selected from the group consisting of 1,3-propanediol and/or oligomers or prepolymers of 1,3-propanediol having a degree of polymerization of 2-9 and mixtures thereof, (2) 20 weight % or less of comonomer diol, and (3) polycondensation catalyst; and

continuously polycondensing the 1,3-propanediol reactant and the 20 weight % or less of comonomer diol to form polytrimethylene ether glycol in a column reactor having two or more reaction stages using the polycondensation catalyst.

97. (New) A continuous process of making polytrimethylene ether glycol comprising:

a. providing 1,3-propanediol reactant selected from the group consisting of 1,3-propanediol and/or dimer and trimer of 1,3-propanediol and mixtures thereof,
b. optionally providing 20 weight % or less of comonomer diol;
c. providing polycondensation catalyst; and
d. polycondensing the 1,3-propanediol reactant and any optional comonomer diol to polytrimethylene ether glycol;

wherein the polycondensation is first carried out in at least one prepolymerizer reactor and then polycondensation continued continuously in a column reactor having two or more reaction stages using the polycondensation catalyst, the 1,3-propanediol reactant comprises 90 weight % or more 1,3-propenediol, and in the prepolymerizer reactor the 1,3-propanediol and any optional comonomer diol is polymerized with the polycondensation catalyst to a degree of polymerization of at least 5.

98. (New) A continuous process of making polytrimethylene ether glycol comprising: (a) continuously providing (1) 1,3-propanediol reactant selected from the group consisting of 1,3-propanediol and/or oligomers or prepolymers of 1,3-propanediol having a degree of polymerization of 2-9 and mixtures thereof, (2) 20 weight % or less of comonomer diol, and (3) polycondensation catalyst; and (b) continuously polycondensing the 1,3-propanediol reactant and the 20 weight % or less of comonomer diol to form polytrimethylene ether glycol in a reactor at a pressure of less than one atmosphere using the polycondensation catalyst.